

THE PAPWORTH VILLAGE SETTLEMENT

Registered Office: PAPWORTH HALL, CAMBRIDGE.

REPORT OF THE COMMITTEE OF MANAGEMENT AND MEDICAL DIRECTOR FOR 1946

PRESENTED AT THE THIRTIETH ANNUAL GENERAL
MEETING OF THE SETTLEMENT, OCTOBER 24TH, 1947

PAPWORTH VILLAGE SETTLEMENT

NEAR

(INCORPORATED)

CAMBRIDGE

[Founder and first Medical Director : The late SIR PENDRILL VARRIER-JONES, F.R.C.P.]

PATRONS

HIS MAJESTY THE KING

HER MAJESTY QUEEN MARY

HER ROYAL HIGHNESS THE PRINCESS ALICE, COUNTESS OF ATHLONE

MAJOR-GENERAL THE RT. HON. THE EARL OF ATHLONE, K.G.

PRESIDENT

HER ROYAL HIGHNESS THE PRINCESS ROYAL

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1918-1925 : THE RT. HON. SIR CLIFFORD ALLBUTT, K.C.B., F.R.S., D.Sc., D.C.L., LL.D., M.D., F.R.C.P. (died 1925).

1925-1934 : SIR HUMPHRY ROLLESTON, Bt., G.C.V.O., K.C.B., Hon. D.Sc., D.C.L., LL.D., M.D., F.R.C.P., &c. (died 1944),

1934-1942 : HIS ROYAL HIGHNESS THE DUKE OF KENT, K.G. (killed on Active Service, 1942).

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The Rt. Hon. the Earl Baldwin, K.G.

*Sir Edward Baron

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G.C.M.G., G.C.V.O., C.I.E., D.S.O.

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LL.D.

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Her Grace the Dowager Duchess of Portland, D.B.E.

The Lord Queenborough, G.B.E.

The Rt. Hon. The Earl of Sandwich, H.M. Lord Lieut-
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J. E. BIDWELL, Esq., M.A. (Cantab.)

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Maurice Davidson, Esq., M.D., F.R.C.P.

Sir Percival Horton-Smith Hartley, C.V.O., M.D.,
F.R.C.P.

G. S. Haynes, Esq., M.D., F.R.C.P.

F. R. G. Heaf, Esq., M.D., M.R.C.P.

The Lord Horder, G.C.V.O., M.D., F.R.C.P.

Air Vice-Marshal A. F. Rook, C.B., O.B.E., F.R.C.P.,
D.P.H., K.H.P.

Professor J. A. Ryle, M.D., F.R.C.P.

Hon. Consulting Radiologists:

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P. J. Kerley, Esq. M.D., M.R.C.P., D.M.R.E., F.F.R.

Hon. Consulting Dermatologist:

C. H. Whittle, Esq., M.D., B.Ch., M.R.C.P., M.R.C.S.

Hon. Physicians:

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W. Paton Philip, Esq., M.C., M.B., Ch.B., D.M.R.E.

Hon. Anaesthetist:

H. N. Webber, Esq., M.A., M.R.C.S., L.R.C.P., D.A.

Hon. Psychologist:

H. Banister, Esq., M.Sc., Ph.D.

Hon. Thoracic Surgeon:

*J. B. Hunter, Esq., C.B.E., M.C., M.Ch., F.R.C.S.

Hon. Consulting Surgeons:

G. E. Gask, Esq., C.M.G., D.S.O.

Air Vice-Marshal Geoffrey Keynes, M.D., F.R.C.S.

H. B. Roderick, Esq., O.B.E., M.D., M.Ch., F.R.C.S.,
D.P.H.

J. S. Paterson Ross, Esq., M.S., F.R.C.S.

Hon. Consulting Laryngologist:

A. S. H. Walford, Esq., F.R.C.S.

Hon. Consulting Bacteriologist:

G. S. Graham-Smith, Esq., M.D., F.R.S.

Hon. Legal Adviser:

Professor P. H. Winfield, LL.D.

Hon. Gynaecologist:

Oswald Lloyd, Esq., M.D., F.R.C.S., M.R.C.O.G.

Hon. Orthopaedic Surgeon:

R. Weeden Butler, Esq., M.Ch., M.D., F.R.C.S.

Hon. Ophthalmic Surgeon:

W. G. Watson, Esq., M.B., Ch.B., D.O.M.S.

Hon. Dental Surgeon:

W. Baird Grandison, Esq., L.D.S., R.C.S. (Ed.).



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GOVERNORS 1946

A. E. Barclay, Esq., O.B.E., M.D.
Miss E. Briscoe
*Capt. R. G. Briscoe, M.C.
†J. E. Bidwell, Esq., M.A.
Miss E. M. Boake, R.R.C.
W. Bulkeley-Evans, Esq., C.B.E., LL.D.
*F. Bunnett, Esq.
*Mrs. J. F. Cameron
Miss H. Chivers
E. Mellish Clark, Esq.
Mrs. Mellish Clark
The Viscount Clifden
Dr. Louis Cobbett

Miss Courtauld
The Hon. Lady Darwin
Lady Darwin
Professor H. R. Dean, M.D.
Mrs. Marcus Dimsdale
Mrs. G. F. C. Gordon
Mrs. A. V. Hill
The Viscount Hinchbrook, M.P.
Lady Hope
Mrs. W. Jenyns
Dr. J. N. Keynes
*Mrs. Keynes
The Marchioness of Linlithgow, C.I.
*G. M. Macfarlane-Grieve, Esq.

*Talbot Peel, Esq., M.A.
The Rt. Hon. the Lord Queen-
borough, G.B.E.
Lady Rolleston
*The Countess of Sandwich
Mrs. J. L. Smith
Mrs. Stewart
Ashley Tabrum, Esq.
Mrs. Robert Tritton
R. S. Whipple, Esq.
*Sir Lionel Whitby, C.V.O.
*I. Winterbottom, Esq.
A. H. Wooll, Esq.

Alderman W. Brown (Hunts. C.C.) and Dr. Robert Ellis (Cambs. C.C.) are
co-opted Members of the Committee of Management.

† denotes Chairman of Committee of Management.

* denotes Member of Committee of Management.

EXECUTIVE STAFF 1946

MEDICAL DIRECTOR :

R. R. TRAIL, M.C., M.D., F.R.C.P.,

MATRON:

MISS E. M. ROBINSON, S.R.N.

CHIEF MEDICAL OFFICER :

L. B. STOTT, M.C., J.P., M.B., B.Ch.,
D.P.H.

GENERAL MANAGER:

PAPWORTH INDUSTRIES:
B. TALLYN

CHIEF ACCOUNTANT:

L. F. PAPE, A.C.A., A.H.A., F.I.A.C.

SECRETARY :

T. C. M. JOHNSON, F.H.A.,

WORKS MANAGER:

PAPWORTH INDUSTRIES:
A. GROGAN

MEDICAL STAFF

CHIEF ASSISTANT MEDICAL OFFICERS :

J. M. Battersby, M.A., M.R.C.S., L.R.C.P.

R. B. Murphy, M.B., Ch.B., B.A.O.

VISITING STAFF :

Physicians :

E. H. Hudson, M.A., F.R.C.P.

K. M. A. Perry, M.A., M.D., M.R.C.P.

Thoracic Surgeon :

O. S. Tubbs, M.A., F.R.C.S., L.R.C.P.

Anaesthetists :

M. P. Sherwood, M.R.C.S., L.R.C.P.,
D.A.

B. Sullivan, M.R.C.S., L.R.C.P., D.A.

RESEARCH STAFF

E. Brieger, M.D.

D. Barron Cruickshank, L.R.C.P. & S.
(Edin.), L.D.S. (Edin.), D.P.H. (Camb.)

CHAPLAIN: Rev. G. W. F. Coupe.

BANKERS:

Barclays Bank, Ltd.
Cambridge.

AUDITORS:

Cambridge : Peters, Elworthy & Moore.
London : Barton, Mayhew & Co.

REGISTERED OFFICE:

Papworth Hall,
Cambridge.

LONDON OFFICE:

16, GROSVENOR PLACE, LONDON, S.W.1.

THE PAPWORTH MEDICAL COMMITTEES

MEDICAL CONSULTATIVE COMMITTEE

*Air-Commodore R. R. Trail, M.C., M.A., M.D., R.C.P., Medical Director (Chairman)

F. R. G. Heaf, Esq., M.D., M.R.C.P.

*J. B. Hunter, Esq., C.B.E., M.C., M.Ch.,
F.R.C.S.

P. J. Kerley, Esq., M.D., F.R.C.P.,
D.M.R.E., F.F.R.

Sir Arthur MacNalty, K.C.B., M.D., F.R.C.P.,
F.R.C.S.

J. Paterson Ross, Esq., M.S., F.R.C.S.

Wilfrid Sheldon, Esq., M.D., F.R.C.P.

*Sir Lionel Whitby, C.V.O., M.C., M.D., F.R.C.P.

MEDICAL RESEARCH COMMITTEE

Sir Arthur MacNalty, K.C.B., M.D., F.R.C.P., F.R.C.S. (Chairman)

Sir Joseph Barcroft, C.B.E., F.R.S.

Professor S. P. Bedson, F.R.S., M.D., M.Sc., B.S.

Professor O. L. V. de Wesselow, D.M.,
B.Ch., F.R.C.P.

F. R. G. Heaf, Esq., M.D., M.R.C.P.

Professor W. H. Tytler, D. Sc.

* denotes Member of Committee of Management.

REPORT OF THE COMMITTEE OF MANAGEMENT, 1946.

In presenting the Report of the Committee of Management for 1946 I am glad to be in a position to record another satisfactory year. Every effort has been made during the year to press forward with the expansion of the Settlement, a matter which could not be dealt with during the war years. We have appointed Mr. A. E. T. Mort, F.R.I.B.A., of Winchester, Architect to the Settlement. Mr. Mort has also been appointed Architect for the Enham-Alamein Settlement as it was considered desirable to have the two kindred Settlements of Papworth and Enham-Alamein developed on similar lines. Mr. Mort's plans for the extension of the Surgical Unit and for a new Sanatorium in the South Park have now been approved by the Ministry of Health, and it is hoped to proceed with these extensions forthwith. The Zoning Sub-Committee have also approved in general principle the proposed future lay-out for the whole Settlement, and Mr. Mort is now engaged in preparing details of the scheme.

Thanks to the generous support and initiative of Mrs. R. G. Edwards, O.B.E., the fund to provide a Children's Home has now reached its target of £20,000, and the plans for the proposed Home to be known as the "Edith Edwards Children's Home", which were prepared by Mr. Connell, A.R.I.B.A., and approved some time ago, are now in hand and it is hoped to proceed with this building shortly.

In order to provide the best possible environment for the children of the

Settlement, the Committee recently entered into negotiations with the Cambridgeshire County Council for the erection of a new School, and a provisional scheme has been approved which will include a three-class Junior and Infant School, together with a Nursery Class.

In order to meet the pressing need for family housing in the Settlement, the Committee approved designs for a type of prefabricated bungalow to be built in the Workshops at Papworth. A licence was obtained and twelve have already been erected, and are proving satisfactory; they are indeed extremely popular with the Settlers. Side by side with this development it has been possible to construct three pairs of brick-built houses during the year with a view to meeting the claims of colonists for permanent houses.

During the year the Settlement, in common with all Nursing Institutions, has experienced the greatest possible difficulty in maintaining the nursing and domestic staff needed to conform with the standards now in force, and it was unfortunately found necessary to close down twenty male beds. Advantage was taken of the Government scheme for the employment of displaced persons from the Baltic States, and the first party of seventeen took up their duties in July. Further numbers have been employed since, and it has been found possible by these means to relieve the nursing staff of a large part of the domestic work which they were previously obliged to undertake. The



A view of the North end of the village. Inset: the Pendragon Estate.

nursing staff, however, still remains below its proper establishment, and the work is very heavy owing partly to the type of cases we have recently been asked to admit.

In spite of the increased salaries required under the Rushcliffe scale for nursing staff, the salaries payable to nurses still compare unfavourably with the wages paid to domestic workers in hospitals.

The adoption also of the National Scales of payment for Hospital Administrative Staff, for Laboratory Workers and Technical Assistants, and the formation of a National Joint Council for Hospital Domestic Staffs, have all resulted in increased salaries and wages.

During the year considerable repairs and painting were undertaken at the Bernhard Baron Hospital and the Princess Hospital, and at the latter the whole of the exterior wooden doors and windows were replaced by steel.

We are very pleased to welcome the return of Dr. L. B. Stott to Papworth after his seven years' service with the R.A.M.C. both at home, and in France and North Africa. He has now resumed his duties as Chief Medical Officer, to the satisfaction of the Committee and the whole Settlement. Dr. D. MacCallum, who acted as Chief Medical Officer during the war, has now taken up his duties in the corresponding post at Enham-Alamein where his experience at Papworth will be invaluable in the development of that Settlement now in progress.

On the recommendation of the Medical Committee, Dr. Lissant Cox was appointed Visitor for 1946 and we are very grateful for the valuable report he has made on the work of the Settlement.

It was a matter of great regret that Mr. John Hunter, the eminent surgeon

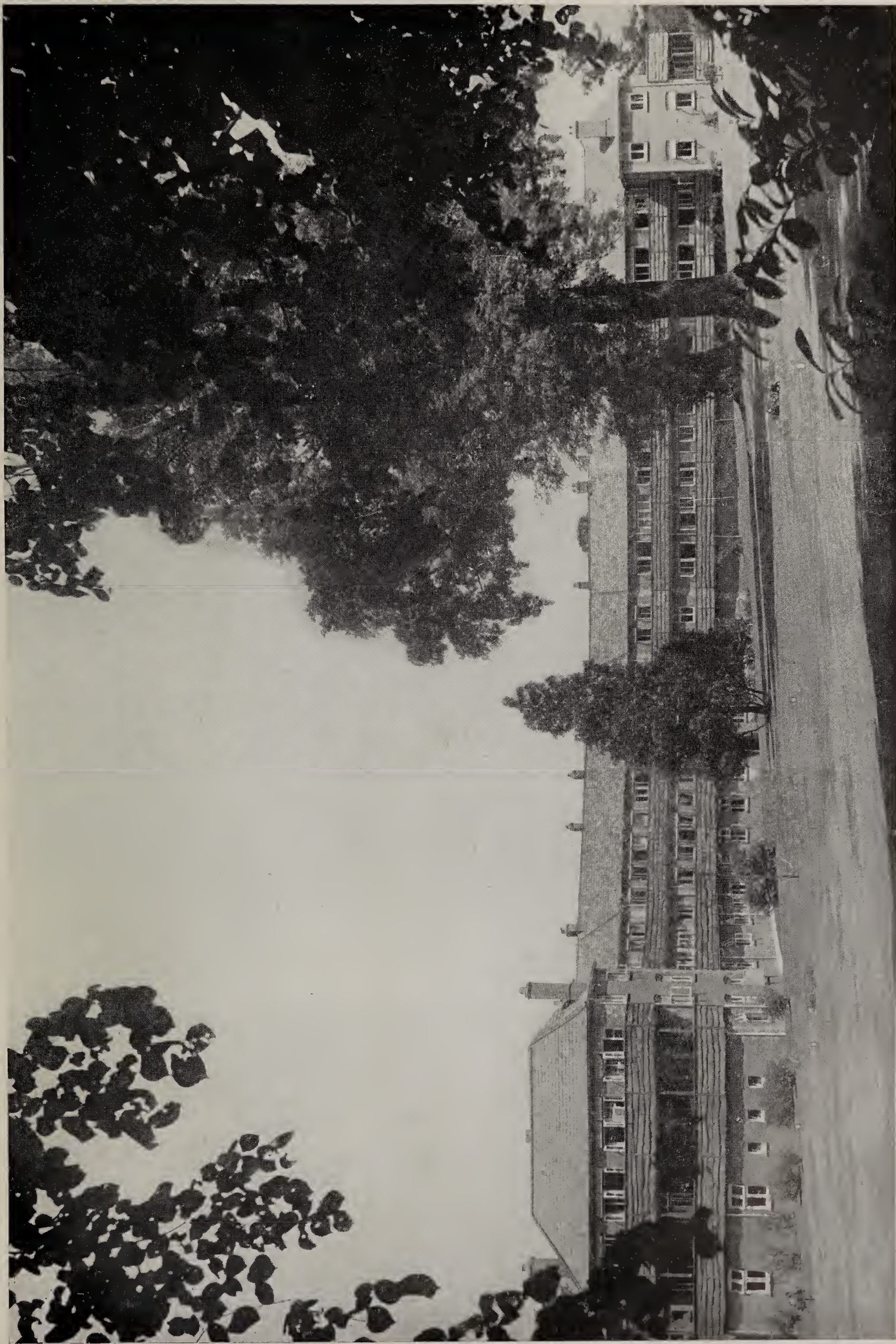
who has done so much for Papworth, was prevented by illness from delivering the Varrier-Jones Memorial Lecture for 1946 but we are very glad to report his satisfactory recovery and the renewal of his help and interest in the work of the Settlement.

We have also to report with very great regret the death of Sir Walter Langdon Brown, a serious loss to the Committee of Management and to the Medical Consultative Committee. The creation of the latter Committee was mainly due to his initiative and his interest in Papworth was unflagging and of the greatest value.

Miss E. M. Robinson who has carried out the duties of Acting Matron since 1943 has now been installed as Matron, and the value of her work and influence in the Settlement is fully recognized. We are also pleased to report the return of Miss E. M. Prentice as Assistant Matron after service during the War in the Q.A.I.M.N.S. With the approval of the Committee, the Medical Director accepted an invitation from the Government of Czechoslovakia to visit that country and advise the Government on the establishment of a Village Settlement on the model of Papworth. In recognition of his military service the Medical Director was awarded the Czechoslovak Order of Merit 1st Class (with crossed swords).

In the Industrial Department we have lost the services of Mr. P. M. G. Fraser who has resigned his position as Managing Director to take up a farming career. The Committee wish to record their sincere thanks for the valuable help given by Mr. Fraser during the years of his residence at Papworth and for his interest in the well-being of the Settlement.

Mr. Tallyn, the General Manager of the Industries, has obtained election as



The Bernhard Baron Hospital for Men containing 109 beds.

the Papworth representative on the Chesterton Rural District Council and has also been appointed Chairman of the Cambs. and Hunts. Branch of the Master Printers' Federation; on both these successes we desire to congratulate him very heartily.

The grateful thanks of the Committee are due to the members of the Honorary and Visiting Staff, to the Hospital Guild and in particular to their President, Lady Whitby and their Hon. Sec. Mrs. Shore, for their continued interest and valuable help. We also wish to thank particularly the British and

Canadian Red Cross Societies for generous gifts of hospital equipment.

Finally, the Committee wish to express their recognition of the unsparing and devoted services of the Medical Director, Dr. R. R. Trail; the Matron, Miss E. M. Robinson; the Secretary, Mr. T. C. M. Johnson, and of all members of both the Hospital and Industrial Staffs during a year of great difficulty.

J. E. BIDWELL,
Chairman.

May, 1946.



St. Mary's Hostel for Women contains 67 beds. Inset : Interior of Dining Room.

REPORT OF THE MEDICAL DIRECTOR

I have the honour to present the Annual Report for the year ended December 31st 1946.

As the Chairman of our Committee of Management has mentioned, we have suffered a severe loss in the death of Sir Walter Langdon Brown, and I wish to record with gratitude his unselfish help to me over many years on every aspect of the work of the Settlement.

Mr. Bidwell has also called attention to the unfortunate necessity to close down some of our beds. For this there is a two-fold reason. The staffing of Sanatoria all over the country presents a very serious problem. Tuberculosis nursing is not yet given the pay or the standing to which it is entitled. The new Rushcliffe Scales do not recognize the specialized form of the work, which must usually be undertaken in isolated conditions. It is to be hoped that the General Nursing Council will consider this fact, and that it will also institute a Register of Assistant Nurses as has been urged by the Tuberculosis Association and the Joint Tuberculosis Council. Otherwise our difficulties are bound to increase.

The second reason is the type of case which we have been compelled to admit since the outbreak of war. A large majority of our patients are in the advanced stage of the disease. Not only does this add very materially to the arduous work of the nursing staff by increased bed treatment ; it also

defeats the main object of our Settlement, which is to arrest the disease by graduated rest and modern methods of collapse therapy, and to rehabilitate those who can return to work in their former occupations or in sheltered industry. Only such patients can hope to secure the true end of treatment by getting back to community and family life, supporting themselves and their dependants, and contributing to the national economy. The duty of the Sanatorium in its public health aspect of segregation of the infectious is nowadays of less ultimate importance than its duty to the individual. We must face facts resulting from an all-round reduction in bed capacity ; we must remember that one dying case retained in an Institution denies treatment to three early cases, who must run the grave risk of themselves becoming advanced while waiting for admission.

During the summer we had a visit for one month from Dr. Wittkower, research scholar of the N.A.P.T. He made a close study of the social aspects of our work, and gave much valuable advice on points which are the foundation of the working of our Personnel Panel. One result has been the decision to appoint a Social Worker who will keep in close touch with the patient from the time of admission, and help the medical and nursing staff in the task of aiding him to accommodate himself to his new way of life.

R. R. TRAIL,
Medical Director.



The Lounge of the Nurses' Home.

GENERAL MEDICAL STATISTICS

		Men	Women	Total
Admissions	... ..	241	140	381
Discharges	... ..	234	145	379
Average No. under				
Treatment	... ..	326	155	481
Total treated during year		572	295	866
Service cases admitted		45	5	50

SURGICAL UNIT (THE NELSON-LANGERMANN HOSPITAL)

Hon. Visiting Surgeon :

J. B. Hunter, C.B.E., M.C., M.Ch., F.R.C.S.

Visiting Thoracic Surgeon :

O. S. Tubbs, F.R.C.S.

Hon. Anaesthetist :

H. N. Webber, M.R.C.S., L.R.C.P., D.A.

Operations performed during 1946 :

Thoracoplasty				
Total number completed during 1946...				47
Total number of stages...	...	...	...	114
Number of deaths	...	...	...	1
Pneumonectomy	...	...	...	1
Thoracoscopies	...	...	...	85
Extra-pleural pneumothorax	...	...	...	2
Phrenic crush	...	...	...	57
Bronchoscopies	...	...	...	13
Drainage of empyema				
mixed infection	...	...	...	1
pyogenic infection only...	...	...	...	1
Orthopaedic (Mr. R. Weeden Butler)	...			7
including 1 tarsectomy and 1 arthrodesis of elbow.				
Other minor operations	...	...	...	5
		Men	Women	
Patients admitted direct for surgical treatment	...	49	61	

Follow-up of thoracoplasties.

In conjunction with the Research Dept., a scheme has been evolved for the "follow-up" of these cases, together with those thoracoplasties to be performed in the future.

REHABILITATION STATISTICS

Patients colonized :		Men	Women	Total
Institution	... ..	7	7	14
Industries	... ..	7	6	13
				<hr/> 27

Number of colonists at
end of year :

Institution	...	28	38	66
Industries	...	214	29	243
				<hr/> 309

X-RAY DEPARTMENT

E. W. Groves, M.S.R.

With regard to the general radiographic work in 1946 with the various plants, not much need be said other than that the department had again to cope with a considerable increase in the demand for radiography.

The total number of exposures made exceeded those in 1945 by 1,219 and the attendance of individual patients increased by 432. The above mentioned excess of 1,219 was largely made up of 435 "straight chest exposures", and 626 exposures of tomograms, for which latter there was a constant and increasing demand.

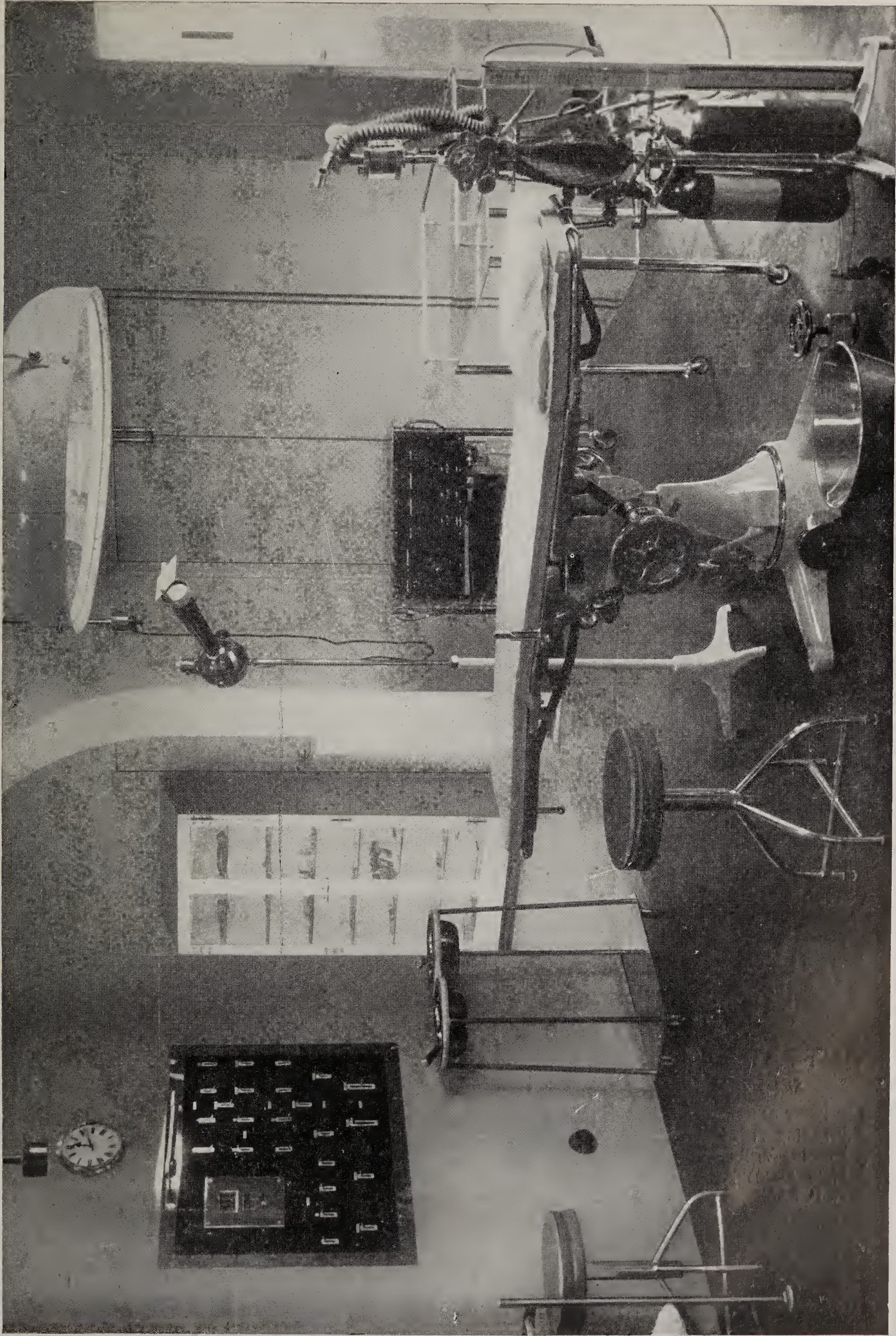
With regard to the various X-Ray plants in use, the main installation of Messrs. A. E. Dean & Co. at the Bernhard Baron Hospital, on which by far the greater part of radiography is undertaken, has continued to function in a most satisfactory and trouble-free manner. The screening plant in the same department is in constant daily use for the screening of chests during routine examinations, and in connection with the Collapse Therapy unit.

The need for a small X-Ray plant with portability as one of its most essential features, had long been felt, and after a number of enquiries from firms and individuals, and including inspection of a plant at the makers by a member of the department, the information was submitted to Dr. Kerley, and following his advice a "Simplex" Unit by Messrs. General Radiological, Ltd., was ordered, and delivered on October 30th.

This unit has proved a most valuable addition to the equipment, and useful work has been undertaken not only in the wards, but also in the private houses of the Settlement. Twenty-three films of 14 patients were taken with this unit in the last two months of the year.

The department has been able to assist in the preparation and demonstration of material for a number of lectures, talks and classes, in particular the N.A.P.T. course in June, held partly at Girton and partly at Papworth.

On this occasion and many others, considerable interest was displayed in the modern



The Operating Theatre in the Surgical Unit.

equipment by visitors, and a number of enquiries of a technical nature were dealt with.

The following is a detailed analysis of the work undertaken during the year.

Bernhard Baron Hospital :

X-Ray photographs	...	...	...	6,865
Electrocardiograms	...	...	...	17
Reduced prints and lantern slides	...	...	...	86

Analysis of films taken

Chests	...	...	...	...	5,084
Bronchograms	...	...	...	...	58
Pyelograms	...	...	...	...	64
Tomograms	...	...	...	...	933
Ba. Meals and Enemas	...	...	...	...	78
Bones and Joints	...	...	...	...	458
Obstetric	...	...	...	...	5
Dental	...	...	...	...	56
Nasal Sinuses	...	...	...	...	77
Other types	...	...	...	...	52

Analysis of Categories of patients

X-Rayed :

In-patients	...	...	...	...	2,798
Adult Villagers	...	...	...	...	1,132
Children of school age normally resident in the Settlement	...	...	...	...	203
Hosp. Special and General Staff	...	...	...	...	362
Patients referred by local authorities and local practitioners	...	...	...	...	354
Private Patients	...	...	...	...	56
Visitors	...	...	...	...	27
Papworth Industries personnel	...	...	...	...	495

Vaughan X-Ray Dept.,

Nelson Langerman Hospital :

Films (All chest)	...	...	...	...	268
Patients	...	...	...	...	261

Portable Unit :

Chest	18	} of 13 patients in ward and 1 in private house.
Other Types	5	

Grand Total :

7,156 films of 5,703 patients.

OUT-PATIENTS DEPARTMENT

Sister E. M. Woods, S.R.N., T.A.

Number of attendances for Year :

Morning Visits	...	...	...	3,888
Evening Visits	...	...	...	2,489
New Cases	...	...	...	806
A. P. Refills	...	...	...	2,596
TOTAL				9,779

Dental Clinic

W. Baird Grandison, L.D.S., R.C.S., (Edin.)

No. of Sessions	...	...	...	114
„ „ Attendances	...	...	...	1,257
„ „ Fillings	...	...	...	462
„ „ Extractions	...	...	...	503
„ „ Scalings	...	...	...	211
Teeth treated with nitrate of silver	...	...	...	67
Gum Etc., Treatments	...	...	...	345
Dentures supplied	...	...	...	94
Dentures repaired	...	...	...	49
Other operations	...	...	...	365

The above statistics cover the period from January 1st, 1946, to December 31st, 1946 inclusive and compare favourably with statistics tabulated for previous years regardless of the fact that for some time during the latter part of the year, difficulties with the non-acceptance of dental letters had to be overcome. The most noteworthy change, statistically, is the figure for gum-treatments which at 345 is much higher than in any previous year. The gum conditions vary considerably, but generally are not serious and respond to hydrogen peroxide and chromic acid. Very probably such conditions will be less frequent when a fuller diet can be expected, especially a diet which will include additional fats.

Physiotherapy Clinic

Miss F. E. Michell, M.C.S.P.

This department is now open every day to treat the patients from the Village and the ambulatory ward patients. Patients are also treated in the B.B.H. and Princess Hospitals and Surgical Block.

The total number of attendances last year was 3,413 and of these 58 were patients during thoracoplasty stages in the Surgical Block. These patients undergoing thoracoplasty operations receive both pre- or post-operative daily treatment, and constitute a large part of the total physiotherapy given to the Settlement. The various forms of treatment given include Faradism, Infra-red Radiation, Ultra-Violet Light, Massage and Remedial Exercises.

Ophthalmic

W. Glasse Watson, M.B., Ch.B., D.O.M.S.

During the year a monthly visit has been made to the Settlement and patients have been seen both in bed and in the consulting room. Most of the work has been the correction of



The Chamberlain Workshop. Inset : a section of Leather Case Making Shop.

errors of refraction, but treatment of other conditions has also been carried out. Where necessary patients have been referred to Addenbrooke's Hospital for operative treatment.

Total number of glasses prescribed : 38. Morbid conditions apart from errors of refraction treated (e.g. conjunctivitis, migraine, chalozion, etc.) : 11.

Examinations where no action was found necessary : 4.

Orthopaedic Clinic

R. Weeden Butler, M.Ch., M.D., F.R.C.S.

Mr. Butler attends monthly to see the orthopaedic patients and sees a wide variety of cases, including those of strain or injury amongst workers in the Industries, any women or children living in the Village who need his attention, and the bed-patients in the B.B.H. and Princess Hospitals or Surgical Block. We are most grateful to him for his help and for the valuable advice in treatments given. During the year 1946 the number of patients seen was 168 out-patients and 84 bed-patients.

Psychological Clinic

H. Banister, M.Sc., Ph.D.

The lot of the tuberculous patient is scarcely ever easy, even in Papworth ; when, to the disease, is added a psychological disturbance life may become very hard indeed. Hence the importance of the psychological clinic where the conflicts are resolved and a re-orientation is made to life so that the battle against the tubercle bacillus can be waged with renewed vigour.

During the year twenty-three patients received treatment in seventy-two treatment periods, a large proportion of the patients being from the Forces. The results of the treatment have been very satisfactory.

RESEARCH DEPARTMENT

E. M. Brieger, M.D.

B. R. Smith, B.Sc., Research Assistant.

A. Johnson, Laboratory Assistant.

1. BACTERIOLOGY AND PATHOLOGY

(1) Life History

(A) Our present theories on the mechanism of infection are limited by the fact that the method of reproduction of the tubercle

bacillus in vitro cultivation as well as in vivo infection is still a controversial issue. Hitherto, two alternatives only have been considered (1) that mycobact. tb. multiplies by elongation and transversal fission like other bacteria, or (2) that granular stages are interposed. In our own investigation on this subject (*Brieger and Fell, 1944 and 1945, and Brieger and Robinow, 1946*) it was suggested that the pattern of reproduction in mycobacteria is related to that of its neighbours in the natural system of bacterial species—i.e. the actinomycetes—an opinion already expressed and much discussed about 50 years ago after Metschnikoff's classical publication in 1888. During the last year we have followed up this line and studied the life-history and the reproductive mechanism in two of our avian strains which showed a mycelial tendency in a very marked degree. A paper on this subject is now in preparation.

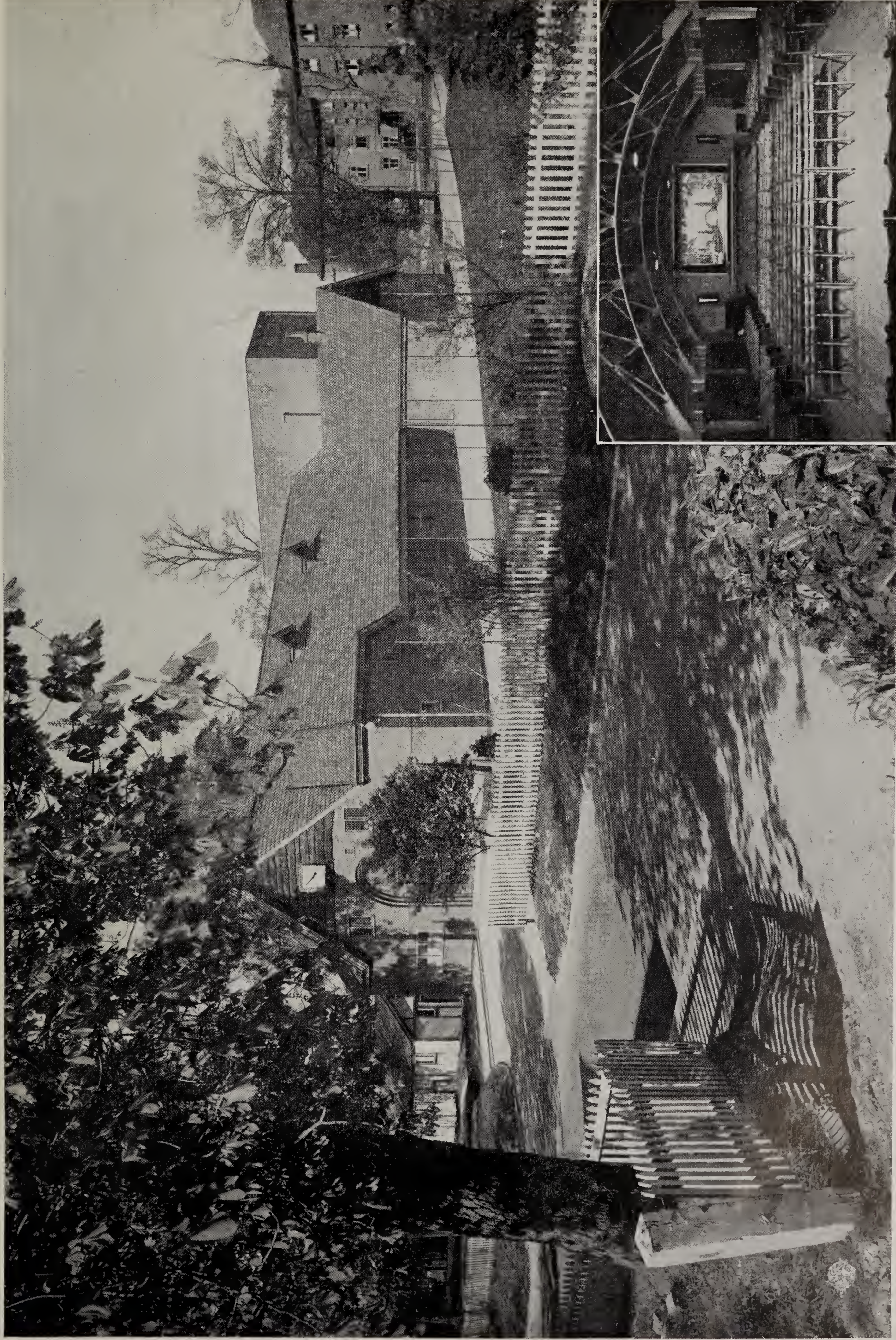
(B) A joint investigation has been started with Mr. J. Smiles, of the Medical Research Institute, Hampstead, to examine the possibilities of direct observation of living cultures grown in the usual way on Loewenstein medium. On the suggestion of Mr. Smiles, the Ultrapak microscope (Leitz), which provides observation in reflected light, was used, and the results already obtained are very encouraging. Work on this is now in progress.

(C) To analyse certain features in the internal structures of the organism and to demonstrate granular phases which might escape investigation in transmitted light, a joint research programme was also initiated with Dr. V. E. Cosslett, F.Inst.P. and secretary of the Electron Microscope Group, Inst. of Physics, and Mr. Crowe, both of the Cavendish Laboratory, Cambridge, to make use of the Electron microscope for a study of this problem. It became apparent that the technique used hitherto for the study of the tubercle bacillus was not adequate, and we have been able to evolve a technique which allows serial observations of development on normal media, which are giving very promising results.

There is reason to expect that from these investigations a scheme for the reproduction of the tubercle bacillus will emerge which might bring into line the conflicting views on the subject.

2. Tissue Response

The joint research with Dr. Honor B. Fell, Director of Strangeways Research Laboratory, Cambridge, on the tissue response and the



Exterior view of the Pendragon Theatre. Inset : Interior view.

control of infection by living tissues in tissue-culture has been continued. Our findings, reported and summarized in a paper now in the press (*Journal of Hygiene*, 1947) led us to the conclusion that the infection of tissue-culture of embryonic chicken-lung with avian bacilli leads at least temporarily to a symbiosis of bacilli and tissue cells, with the result that the tissue-culture is not killed by the infection with virulent bacilli, while on the other hand avirulent bacilli are ingested but not destroyed by tissue cells. Details are given in the above-mentioned publication.

As these findings do not agree with those obtained by Maximov in the infection of adult rabbit tissue with virulent and avirulent bacilli of the bovine and human type, the question arose whether adult tissues respond differently from those of the chicken embryo. We did, however, show that this was not the case. The same avian bacilli which produced a widespread tuberculosis after intraperitoneal infection in rabbits did not affect the tissue-cultures from rabbit spleen in any demonstrable way.

We are now engaged in repeating and expanding Maximov's experiments by applying the viability tests devised in this laboratory and described in previous annual reports. This line of research, carried out by a team of workers, and combining tissue culture and bacteriological methods, has not only a theoretical interest. It is quite possible that if our results are confirmed by the experiments now in progress, our present views on the mechanism of infection in tuberculosis will have to undergo reconstruction.

3. Practical Use of the Viability Test

Having shown by our viability tests that there is no evidence for the destruction of the tubercle bacilli through phagocytosis in tissue culture, the question was examined whether in the process of human infection the destruction of bacilli by the tissue could be demonstrated by this method. There was evidence that in cases of efficient artificial pneumothorax the colonies which grew on sputum smear cultures were very poor and consisted of short granular bacilli which were only slightly acid-fast. Similarly, in a healed focus of an A. P. lung, colonies grew in smear cultures made from the caseous content but only very poorly, with the bacilli showing morphological abnormalities. This question is being further studied: (a) jointly with the Sims-Woodhead Laboratory, and (b) with Dr.

Barrett, Reader in Morbid Anatomy and Pathologist to Addenbrooke's Hospital.

II. OTHER ACTIVITIES

It has been necessary to devote all our time to develop the research programme outlined above, and which was approved by the Medical Research Committee. Other activities, on which reports have been made in previous annual reports, have had to be discontinued. However, efforts have been made to avoid a break in continuity.

1. Children's Survey

The publication of *PAPWORTH FAMILIES* has been received very well by the medical critics, and a wish was expressed that this survey should be continued and a review of the situation presented in ten years' time. The recording has, therefore, been continued and is in the hands of a colonist who has been engaged in this work for several years.

2. Assessment of Working Capacity

Great interest has been shown from many quarters in the work done at Papworth in developing a scheme for the assessment of working capacity. In our last report we mentioned that a publication was in preparation, and this work is now nearing completion. The first part of this work will be devoted to the statistical assessment of the demand for rehabilitation, and a scheme for such research was explained in previous publications (*After-care and Rehabilitation*, 1937, *Papworth Research Bulletin*, 1938, and *Tubercle*, 1945).

3. Demonstrations, etc.

(i) A demonstration was given at the Meeting of the Refresher Course for Tuberculosis Officers in 1946 at Cambridge and Papworth.

(ii). In co-operation with Dr. Honor B. Fell, a film on our observations on phagocytosis in tissue culture was made by Dr. Hughes, Strangeways Research Laboratory, Cambridge, using, for the first time, phase-contrast photography. This film, edited jointly by the Strangeways Research Laboratory and Papworth Village Settlement, has been shown to many audiences in this country and the U.S.A., and has met with great interest.

(iii). A demonstration was given to the medical students, Part II (arranged by Dr. M. M. Wilson).



The Village Stores. Inset : A section of the Provisions Department and Post Office.

4. Publications

- E. M. Brieger : *Journal of Pathology*, 1944
E. M. Brieger and Honor B. Fell : *Journal of Hygiene*, 1945. 44. No. 3.
E. M. Brieger and Honor B. Fell : *Journal of Hygiene*, 1946 44. No. 4.
E. M. Brieger and C. F. Robinow : *Journal of Hygiene*, 1947 (now in the press).

Acknowledgements.

I wish to express my gratitude to Dr. Honor B. Fell, Director of Strangeways Research Laboratory, Cambridge, and Professor H. R. Dean, Department of Pathology, Cambridge, for their hospitality in putting at my disposal again facilities for the carrying-out of part of my research work at a time when the Papworth facilities are still inadequate, pending the execution of plans for the permanent accommodation of the Research Department.

THE SIMS WOODHEAD MEMORIAL LABORATORY

D. Barron Cruickshank, L.R.C.P. & S. (Edin.),
L.D.S. (Edin.), D.P.H. (Camb.)
Technical Asst. : F. Boot, A.I.M.L.T.

We have now been in occupation of the expanded Laboratory for approximately one year, and are finding the extra accommodation of tremendous help. A brief account of

some of our activities is given below.

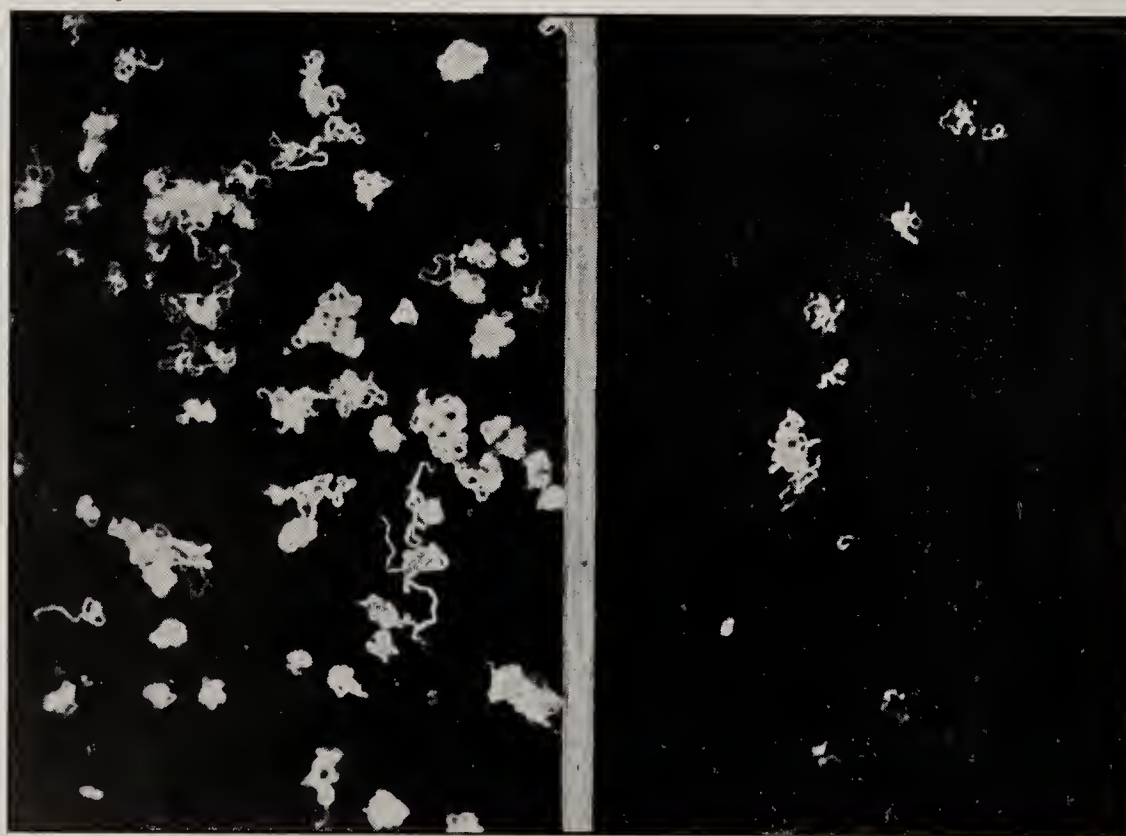
BACTERIOLOGY

We are now using *fluorescence microscopy* as an aid to the detection of tubercle bacilli in sputum. This method, used by an increasing number of sanatoria, has recently been improved to such an extent that it has become a serviceable addition to existing methods. While its specificity equals that of the Ziehl-Neelsen method, the latter is so firmly established that its replacement in toto by the fluorescence method is not likely to happen before the passing of another decade. We use the method as an intermediary between Ziehl-Neelsen direct smear and cultures, and regard it as equivalent to a concentration method. Approximately 17 per cent of Ziehl-Neelsen negatives become positive by the fluorescence method. At present all results are checked by culture.

We are also investigating its use in relation to *slide culture* technique; recognition of seven-day colonies is considerably facilitated by the use of fluorescence stains, and some photographs of the effect are shown in this report. A communication *Towards Fluorescence Microscopy*, recording our experiences to date appeared in the May issue of *Tubercle*.

Careful records of all routine sputum investi-

PHOTOGRAPHS OF COLONIES OF *M. tuberculosis* FROM SPUTUM ; FLUORESCENCE STAIN.
(7-Day Slide-Culture Technique)



Original Specimen
Ziehl-Neelsen +ve

Direct Smear

Original Specimen
Ziehl-Neelsen —ve

Direct Smear

Standard magnification : 16 mm. objective ; $\times 10$ ocular.

[Reproduced by permission of "*Tubercle*."

gations are kept with the intention of building up a statement of the minimal conditions essential for accuracy and of the variables requiring control in order to ensure success and economy in practice. Such knowledge offers a basis for adequate and accurate interpretation of laboratory findings in relation to clinical and sociological implications.

A new *sputum disposal plant* has been designed and constructed ; this is equipped with a Warner automatic washing and sterilizing unit. Certain ancillary furnishings are still under manufacture, but the plant should soon be in daily use.

At the request of the National Association for the Prevention of Tuberculosis a *memorandum on the disposal of sputum* was prepared and submitted to their Architectural Committee.

The Laboratory participated in the two successful *Post-Graduate Instruction Courses* held at Papworth in January and June 1946.

Penicillin sensitivity determination and the assay and preparation of penicillin solutions occupied appreciable time. Penicillin has proved itself valuable in the treatment of secondarily infected empyemas, in the treatment of various lung infections and in prophylaxis after surgical procedures. In addition, it has many applications in minor medicine.

Our *Milk Supply* is still tested daily by the phosphatase test. It is pleasing to record that we have been able to arrange that *pasteurized, tuberculin-tested milk is now on sale in the village* and so available to all who desire to purchase it, an aim towards which we have worked for some considerable time.

BIOCHEMISTRY

Work has been done on the determination of the *excretion of blood products following transfusion*. This is partly a routine check on possible post-transfusion reactions, but is also revealing some facts of interest regarding blood products from thoracoplasty wounds.

We are also interested in the *Histidine excretion* of the tuberculous subject, particularly in cases with artificial pneumothorax. It was observed in the course of work on the histidine method (which was worked out last year) that patients in whom artificial pneumothorax had been induced, appeared to show definite changes in their histidine excretion. A major complication of the investigations is the number of variables which require circumvention. The basic point at issue is whether or not histidine has some significant rôle in the resistance against tuberculosis.

Routine biochemical work shows little change from the previous years, and the general nature of the work will be gathered from the Tables.

We are continuing the *training of nurses* in the elementary laboratory procedures required by the syllabus for the Tuberculosis Association Certificate.

In relation to *hospital diet* we undertook several analyses of food in order to determine the protein, carbo-hydrate, and fat content, and the calorie value. The chemical findings were compared with an independent analysis of the calorie value of the food issued to the whole settlement over a period of one month.

STATISTICS

The study of *Regional Influences in Cancer* as measured by a method evolved in this Laboratory, has now been completed, and the work has been accepted by the *British Journal of Cancer*. The main conclusion is that regional influences are present in every part of the country, and, although they vary in intensity, they are generally very powerful in their effects. While cancer was studied in this instance, the method is applicable to other disease distribution, and it may therefore be possible to study the regional influences in tuberculosis.

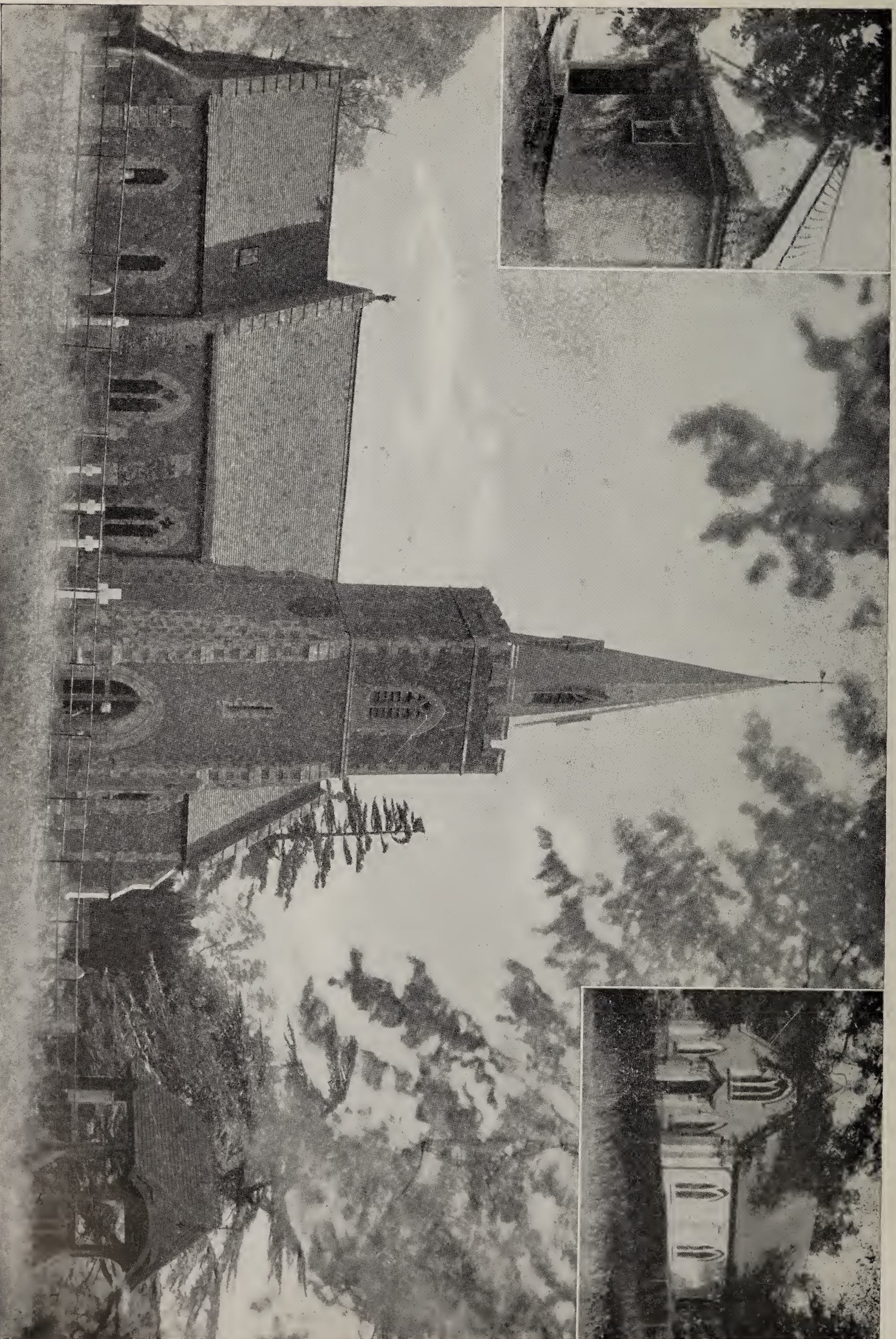
A *Thoracoplasty Follow-up scheme* has been worked out and put into practice. There is a special history sheet for each case, augmented by data obtained 6 months, 1, 3, and 5 years after the operation. The data are filed under an effective and simple system designed to facilitate the ultimate analysis of the accumulated material.

HAEMATOLOGY

The routine use of transfusions at thoracoplasty operations considerably increased the work in the haematological branch, as numerous groupings and cross-matchings had to be undertaken. The Rhesus factor tests are made by the courtesy of the laboratory of the local Regional Blood Transfusion Service of the Ministry of Health.

LIBRARY

We are in receipt of an annual grant from the Medical Consultative Committee for the purpose of *building up and maintaining a tuberculosis library*. This is growing slowly, but satisfactorily. We aim eventually to receive all standard tuberculosis periodicals, and have the further ambition of acquiring for our archives reprints of every article dealing with any aspect of tuberculosis whatever its country of origin.



St. Peter's Parish Church. Inset : (left) The porch of the Roman Catholic Church, and (right) the Methodist Chapel.

The *full cross-indexing* of all articles, papers, communications and reprints received by the library has proved extremely useful. The title, author's name and, frequently, a resumé of the contents are typed in multiple on index slips, and each slip indexed under ALL the various sub-headings by which the article might conceivably require to be traced by a reader providing only partial reference. The present accommodation is inadequate, but it is hoped that before long more library space will become available.

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THE VILLAGE

During the year, 2578 visits were paid to the homes of the settlers and staff in the village by the Village Sister. Eight babies were born to our families, all confinements taking place at the County Hospital, Cambridge.

Childhood complaints were noticeably less than in 1945, and nothing approaching even a mild epidemic of any of the notifiable children's diseases was experienced.

PAPWORTH INDUSTRIES

B. Tallyn, General Manager

The beginning of the year found us with many problems to solve, not the least of which was the switchover from War- to Peace-time production.

With the curtailment of Government contracts this called for careful forward planning. New outlets had to be found for our expanded productive capacity, against a background of shortage of raw materials, fuel and transport. In addition our plant required considerable overhauling and replacement. Nevertheless much progress was made and whilst there are still many difficulties ahead of us it is encouraging to be able to report that :—

MARKETS

Practically the whole output of our Traveling-goods Department was earmarked for export. It has not been easy to keep up the high standard of Pendragon Luggage, with the inferior locks and fittings available, but by stylizing our lines and designing an entirely new type of suitcase lock, we have succeeded, not only regaining our old overseas customers, but have also been able to open new export business. Letters from our Agents in U.S.A., South America, Canada and Mexico have been appreciative, and speak of the demand in these countries for Pendragon products.

In the Woodworking Departments new markets were opened for the Papworth Mammoth All-Electric Incubators in Turkey, Palestine, Kenya, South Africa, and Egypt, and these Departments also secured important contracts for re-furnishing many of the Cambridge and Oxford colleges.

In addition to the considerable volume of work done for H.M.S.O., the Printing and Binding Department was successful in opening new accounts with some of the most famous Publishing Houses in the country, and it is indeed gratifying as a result of this to see the Pendragon Press Imprint becoming more and more evident in the bookshops and on the bookstalls.

PLANT

Having always before us our policy of preserving the energy of our disabled workers by the increased use of mechanical power, we have, with the sanction of the Committee of Management, made various additions to our plant. There is much more to be done in this direction as the requisite machinery becomes available.

FUEL

The shortage of fuel is likely to remain one of our major problems and it is therefore interesting to record that by various devices and the willing co-operation of the factory personnel we were able to make a saving of some 200 tons of solid fuel compared with the corresponding period last year.

HOUSING

In spite of the great shortage of building materials and with a small building staff of less than 40, we succeeded in completing three pairs of brick cottages, brought another pair to roof-height, and a further pair to top-floor level. It was realized that this would not make much impression on the long waiting lists ; we therefore designed a suitable bungalow which could be fabricated in our own Workshops and quickly erected.

Permission was given for 12 of these to be commenced in November and they will be ready for occupation at the end of February. These will take care of the most urgent cases, but many more houses will be required if we are to fulfil our task of rehabilitating the disabled by providing work under sheltered conditions. That our factories could at the moment employ another 500 disabled persons, if only they could be housed, is the measure of the problem.

The growing importance of the Settlement's work in the Industrial field is indicated by the selection of a member of the Industrial Staff to serve as Chairman of the Cambridgeshire and Huntingdonshire Branch of the Master Printers' Federation and as Chairman of the Cambridgeshire and Huntingdonshire District Committee of the E. R. B. and also to the Committee of the Cambridgeshire and Huntingdonshire District Disablement Advisory Committee.

Whilst these appointments add further responsibilities and obligations, it is felt that they are well worth while, keeping us as they do in closer touch with modern industrial trends.

Conversely the specialized work of the Industries thus becomes more widely known and appreciated.

The Industries' War effort was recognized by the recommendation of one of our work-people, Mr. T. W. Davis for the B.E.M.

It is with regret that we have to record the passing of two respected servants of the Company, each of over 20 years' service—

J. Ford

H. Saunders

At all times by their endeavour and example they set a very high standard of service and their loss will be very greatly felt in the department where they worked.

The year has seen much work of consolidation and the greatest thanks are due to the staff and factory personnel for their loyal support and co-operation. With the same team spirit that now exists between Management and men prevailing, we look forward to the coming year with every confidence.

THE SOCIAL LIFE

There is probably little, if anything, to differentiate between the social life of Papworth and of any other normal small town or large village in the variety of its events and social functions, except perhaps in the manner of their presentation. Whatever is organized by the citizens of Papworth shows all the evidences of keen and alert minds. There is little that is haphazard : nothing is left to chance ; if improvisations are necessary they are not obvious.

1946 has seen the gradual fading-away of a great many events of a purely entertaining nature which sprang up with the war, and in this of course, Papworth is not alone.

E.N.S.A. paid its last visit to the hospitals in August, the Service shows which gave so much entertainment gradually faded out as demobilization took its toll of the R.A.F. talent, and gradually the village turned its mind to more serious things.

The County Council elections in March, and the Rural District election in April, when Mr. B. Tallyn was elected Councillor for the parish, seemed to stimulate interest in Local Government and in May a crowded Parish Meeting called for the election of a Parish Council, which was duly elected with all the blessings of the more senior local authorities in September.

Of course the usual local activities have been carried on with enthusiasm : the Youth Club, the W.E.A., the B.R.C.S. with its Senior and Junior detachments and its "Links"; cinema shows, flower and vegetable shows, etc. A new venture is the Old-Time Dancing Club, successfully launched in February and holding regular fortnightly meetings.

We have to thank the following for providing entertainment during the year :

The Cambridge Brotherhood Band for their annual Christmas concert.

The Nurses' Social Club for a play "Quiet Wedding".

P. A. Productions for "Blithe Spirit".

R.A.F. Oakington for "Love from a Stranger" and "Outward Bound".

Papworth Dramatic Club for "Jane Steps Out" "Distant Point", "The Importance of Being Ernest".

The Crazy Gang for "Crazy Variety".

"Fitz" of Newmarket for a Ward Show.

Miss Alice Reynolds for "Variety Highlights".